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“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 5484 (1997): EC grade aluminium rod produced by continuous casting and rolling [MTD 7: Light Metals and their Alloys]

“ज्ञान से एक नये भारत का निर्माण”

Satyanaaranay Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartṛhari—Nītiśatakam

“Knowledge is such a treasure which cannot be stolen”



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ई सी ग्रेड एल्यूमीनियम छड़ — विशिष्टि
(दूसरा पुनरीक्षण)

Indian Standard

**EC GRADE ALUMINIUM ROD PRODUCED
BY CONTINUOUS CASTING AND
ROLLING — SPECIFICATION**

(Second Revision)

ICS 77.150.10

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by Light Metals and Their Alloys Sectional Committee had been approved by the Metallurgical Engineering Division Council.

In this standard requirements are laid down for EC grade redraw rods produced by continuous casting and rolling for further fabrication by drawing into wire for electrical conductors.

As the rod, from which wire is drawn, is chosen by the conductor manufacturers to suit their individual wire drawing equipment and the final products, only broad specifications have been attempted in this standard. However, every effort both by the rod producers and conductor manufacturers in their respective capacities, should be made to improve the quality of EC grade aluminium redraw rods and the conductors made therefrom.

This standard contains clauses 8.2, 9.1, 11.1 and 14.2 which calls for agreement between the purchaser and the supplier and clauses 15.1 and 15.2 which requires the manufacturer to supply required information.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

AMENDMENT NO. 1 APRIL 2011
TO
IS 5484 : 1997 EC GRADE ALUMINIUM ROD
PRODUCED BY CONTINUOUS CASTING AND
ROLLING — SPECIFICATION

(First Revision)

(Page 2, clause 9.1.2, first para) — Substitute the following for the existing:

'At a temperature of 20°C the resistivity of the samples shall not exceed 0.030 247 ohm.mm²/m (57 percent IACS conductivity) for the rods produced from aluminium as per IS 4026 : 2007 Aluminium ingots, billets and wire bars (EC Grade) (fourth revision).'

Indian Standard

EC GRADE ALUMINIUM ROD PRODUCED BY CONTINUOUS CASTING AND ROLLING — SPECIFICATION

(Second Revision)

1 SCOPE

This standard covers the requirements for EC Grade aluminium redraw rods, in 9.5 mm and 7.6 mm in nominal diameter, produced by continuous casting and rolling for electrical conductors.

2 SUPPLY OF MATERIAL

The general requirements relating to the supply of material shall conform to IS 1387 : 1993.

3 REFERENCES

The Indian Standards listed below are necessary adjuncts to this standard:

IS No.	Title
1387 : 1993	General requirements for the supply of metallurgical materials (<i>second revision</i>)
1608 : 1995	Mechanical testing of metals — Tensile testing (<i>second revision</i>)
4026 : 1987	Aluminium ingots billets and wire bars (EC grade) (<i>third revision</i>)
5047 (Part 1) : 1986	Glossary of terms relating to aluminium and aluminium alloys: Part 1 Unwrought and wrought metal (<i>second revision</i>)

4 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 5047 (Part 1) shall apply.

5 MANUFACTURE

5.1 The ingot used for manufacturing rods by continuous casting and rolling process shall conform to the requirements of Grade 2 (Al 99.6 percent) of IS 4026.

6 MATERIAL

The rod shall be supplied in coil form not exceeding two lengths in each coil.

7 SELECTION OF TEST SAMPLES

7.1 A tensile test sample and a resistivity test sample shall be taken to represent each 2.5 tonnes or less of rod in the lot.

7.2 For chemical composition, one test sample shall be taken to represent one furnace load.

8 TENSILE STRENGTH

8.1 The tensile strength of the rolled rod shall be as given in Table 1.

Table 1 Tensile Strength Limits of Rolled Rod

Range (1)	Rods Produced from Grade 2 and Aluminium, Tensile Strength (MPa) (2)
I	65 to 100
II	85 to 125
III	100 to 135
IV	110 to 155

NOTES

1 1 MPa = 1 MN/m² = 1 N/mm² = 0.102 kgf/mm².
2 The tensile strength of the rod will vary depending upon the chemical composition and the work hardening that takes place during the rolling process. Since the purchaser has to order material to suit his equipment, technique and the end product, only a general indication of the range of tensile strength is given in this standard.

8.2 The desired tensile strength range shall be as agreed to between the supplier and the purchaser. Elongation determination shall not be required for Grade 2 material unless specifically agreed upon by the supplier and the purchaser. However, elongation shall not be determined in specimens containing joints.

8.3 The tensile test shall be conducted in accordance with IS 1608.

9 RESISTIVITY

9.1 Resistivity shall be determined on representative samples by resistance measurements.

9.1.1 At a temperature of 20°C the resistivity/conductivity of the samples of rods produced from aluminium of Grade 2 shall be as follows:

Type	Resistivity at 20°C ohm. mm ² /m <i>Max</i>	Conductivity Percent IACS <i>Min</i>
Type 1	0.028035	61.5
Type 2	0.028264	61.0

NOTE — In case purchaser has not specified the requirement of conductivity, the same shall be 61 percent IACS minimum at 20°C.

9.1.2 At a temperature of 20°C the resistivity of the samples shall not exceed 0.030 247 ohm.mm²/m (57 percent IACS conductivity) for the rods produced from aluminium of Grade 4.

NOTE — Resistivity is used in place of conductivity. The value of 0.017 241 ohm.mm²/m at 20°C is the international resistivity of annealed copper equal to 100 percent conductivity. This term means that a copper wire 1 mm in cross section and one meter in length would have a resistance of 0.017 241 ohm.

9.2 The resistivity measurements shall be made on samples of rods in the temper as furnished.

10 DIMENSIONS AND PERMISSIBLE VARIATIONS

10.1 The rod shall be rolled to a nominal diameter of 9.50 mm within the permissible variation of ± 0.50 mm or to a nominal diameter of 7.6 ± 0.40 mm.

11 JOINTS

11.1 Joints in the rod, if agreed upon between the supplier and the purchaser, shall be made by electric butt-welding or by cold-pressure welding.

12 FINISH AND FREEDOM FROM DEFECTS

12.1 The rod shall be commercially clean.

12.2 The rod shall be sound, smooth and free from pipes, laps, cracks, kinks, twists, seams, and other injurious defects within the limits of good commercial practice.

13 RETEST

If a sample selected for testing fails to meet the requirements of the specification, two further samples shall be taken from the same lot represented by the sample. If either of these samples fails to meet the requirements of the specification, the lot represented by the sample shall be rejected.

14 PACKING

14.1 The material shall be packed in coils.

14.2 Coil size and weight shall be agreed upon by the supplier and the purchaser at the time of placing the order.

14.3 Coils need be wrapped only when specified in the order. The quality and application of the wrapping material should be adequate to protect wire-rods from damage, incidental to normal handling and shipment.

15 MARKING

15.1 Each coil shall bear a tag showing the manufacturer's name or trade-mark, weight and tensile range of material. If additional information is required on the tags, it shall be arranged with the manufacturer at the time of placing the order.

15.2 The coil shall carry a distinguishing tag, wrapping or like, to indicate if the coil is in two lengths and if the material contains any joints.

15.2.1 The material may also be marked with Standard Mark.

15.2.1.1 The use of the Standard Mark is governed by the provision of the *Bureau of Indian Standards (Certification Mark) Act, 1986* and Rules and Regulations made thereunder. The details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers, may be obtained from the Bureau of Indian Standards.

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This Indian Standard has been developed from Doc: No. MTD 7 (4185).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 323 01 31, 323 33 75, 323 94 02

Telegrams: Manaksantha
(Common to all offices)

Regional Offices:

Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	323 76 17, 323 38 41
Eastern	: 1/14 C.I.T. Scheme VII M, V.I.P. Road, Maniktola CALCUTTA 700054	{ 337 84 99, 337 85 61 337 86 26, 337 91 20
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160022	{ 60 38 43 60 20 25
Southern	: C.I.T. Campus, IV Cross Road, CHENNAI 600113	{ 235 02 16, 235 04 42 235 15 19, 235 23 15
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	{ 832 92 95, 832 78 58 832 78 91, 832 78 92
Branches	: AHMADABAD. BANGALORE. BHCPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. PATNA. PUNE. THIRUVANANTHAPURAM.	